

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Fisher et al.

Art Unit: 2827

Serial No.: 09/705,466

Examiner: Thai, Luan C.

Filed: 11/03/2000


Docket No.: TI-24980

For: ENCAPSULATION FOR PARTICLE ENTRAPMENT

APPEAL BRIEF UNDER 37 C.F.R. § 1.192

12 April 2004

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

MAILING CERTIFICATE UNDER 37 C.F.R. § 1.8(A)	
I hereby certify that the above correspondence is being deposited with the U.S. Postal Service as First Class Mail in an envelope addressed to: Commissioner For Patents, PO Box 1450, Alexandria, Virginia 22313-1450 on the date shown below.	
	12 April 2004
Charles A. Brill	Date

Dear Sir:

The following Appeal Brief is respectfully submitted, in triplicate, in connection with the above-identified application in response to the Final Rejection mailed 16 September 2003.

Please charge all required fees, including any extension of time fees, to the deposit account of Texas Instruments Incorporated, Deposit Account No. 20-0668.

REAL PARTY IN INTEREST

The real party in interest is Texas Instruments Incorporated, to whom this application is assigned.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences known to the Applicant's legal representative.

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STATUS OF THE CLAIMS

This application was originally filed with sixteen claims, two of which were written in independent form. Claims 11-16 have been withdrawn from consideration as being directed to a non-elected invention in response to a restriction requirement filed 29 January 2002. Claims 1 and 2 were amended on 12 July 2002, and Claim 2 was amended on 29 January 2003.

STATUS OF THE AMENDMENTS

An amendment after the first final rejection was filed on 29 January 2003. The Examiner stated the amendment after final would be entered. No amendments were filed after the second final rejection.

SUMMARY OF THE INVENTION

Specification page 6, lines 3-11 and page 7, lines 11-15, provide a concise explanation of the invention defined in the appealed claims. The invention provides a method of blocking debris either release from debris harboring regions or generated by debris generating regions from migrating to debris-intolerant portions of a packaged micromechanical device. As shown in Figure 3, a blocking material (116) is deposited around the micromechanical device (100) to block debris from coming out from voids (112) underneath the device or from being released from the sidewalls of the device.

ISSUES

1. Whether Claim 1 is unpatentable over Chun, U.S. Patent 5,644,169 in view of Glenn, U.S. Patent 5,962,810 under 35 U.S.C. § 103 (a).
2. Whether Claim 5 is unpatentable over Chun, U.S. Patent 5,644,169 in view of Glenn, U.S. Patent 5,962,810 under 35 U.S.C. § 103 (a).

GROUPING OF THE CLAIMS

Claims 1 and 5 are independently patentable and stand or fall individually for the reasons more clearly set forth hereinbelow. Claims 2-4 and 7-10 stand or fall together with Claim 1, from which Claims 2-4 and 7-10 depend. Claim 6 has not been rejected, but is objected to for depending upon a rejected base claim.

ARGUMENTS

Issue 1:

1. Whether Claim 1 is unpatentable over Chun, U.S. Patent 5,644,169 in view of Glenn, U.S. Patent 5,962,810 under 35 U.S.C. § 103 (a).

Claim 1 was rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,644,169 to Chun ("Chun") in view of U.S. Patent No. 5,962,810 to Glenn ("Glenn"). The applicant respectfully disagrees and submits the Examiner has failed to present a prima facie case of obviousness.

"To support the conclusion that the claimed combination is directed to obvious subject matter, either the references must expressly or impliedly suggest the claimed combination or the examiner must present a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references." Ex parte Clapp, 227 U.S.P.Q. 972, 973 (Bd. Pat. App. & Inter. 1985).

The Examiner has the duty to present a prima facie obviousness rejection. The Examiner stated, "Chun further teaches . . . attaching a package lid 7 (e.g., transparent lid) to the package substrate 1." The Examiner further stated, "Glenn et al. . . . teach (see specifically figures 1-3) the step of encapsulating the side surfaces (22) (e.g., the debris generating regions) of the CCD

chip (14) . . . the bond wire (18), and the bond pads (17/19) by using a photo-curable adhesive blocking material (20) . . . , wherein the blocking material (20) is avoiding contact with the debris-intolerant region (24) (Col. 4, lines 52-55 and Col. 6, lines 47-52) in order to *cover and protect* the side surfaces (e.g., the debris generating regions) of the CCD chip and the bond wires which connect the bond pads of the chip and the substrate (Col. 4, lines 24-61).” (emphasis in original)

Claim 1 recites, “attaching a device to a package substrate . . . and . . . attaching a package lid to said package substrate, to enclose said device and said blocking material.” The Examiner has not pointed to any teaching in Chun and Glenn that shows, teaches, or suggests this limitation in combination with the additional limitations of Claim 1. Glenn states, “Bead 20 has a top first portion 25, an opposite lower second portion 26, an outer third portion 27, and an inner fourth portion 28 adjacent to die 14..” Thus, Glenn teaches away from “attaching a package lid to said package substrate, to enclose said device and said blocking material” as recited by Claim 1, by teaching a bead forming a solid package sidewall that surrounds the die 14 and adheres to and separates transparent encapsulant 29 from the substrate—holding the lid and the substrate apart rather than “attaching a package lid to said package substrate” as recited by Claim 1. Furthermore, the combination of Chun and Glenn devised by the Examiner does not suggest the limitation of “enclose[ing] said device and said blocking material” as recited by Claim 1, but rather uses the bead in combination with the substrate and lid to enclose the device, leaving the bead exposed.

The Examiner has failed to show an express or implied suggestion in the art, or provide any line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references as required by Ex Parte Clapp. The Examiner

stated, “It would have been obvious . . . to modify the process of Chun by applying the step of encapsulating the side surfaces (e.g., the debris generating regions) of the CCD chip with a photo-curable adhesive blocking material, as taught by Glenn et al., in order to *cover and protect* the side surfaces (e.g., the debris generating regions) of the CCD chip and the bond wires which connect the bond pads of the chip and the substrate.” (emphasis in original)

The applicant respectfully submits that Glenn does not teach, as stated by the Examiner, “encapsulating the side surfaces . . . in order to *cover and protect* the side surfaces” The passage cited by the Examiner states, “As shown in FIG. 1, bead 20 protectively covers each metal trace 16, contact 17, bond wire 18, and bonding pad 19 located on or adjacent to first surface 12 of substrate 11. Bead 20 also covers side surfaces 22 of die 14 and the periphery of upper first surface 21 of die 14, including bonding pads 19.” Thus, the sides are covered, but no mention is made of protecting the side surfaces.

Furthermore, since no mention is made in either reference of a the sidewalls being debris generating, nor of the CCD portion being debris-intolerant, the Examiner’s suggestion to modify is not found in the art and represent impermissible hindsight. As the Examiner has failed to provide a suggestion in the art to make the proposed modification, the Examiner has failed to present a prima facie case of obviousness.

For the reasons stated above, the Examiner has not met the burden of presenting a prima facie case of obviousness. Therefore, the rejection under 35 U.S.C. § 103(a) is defective and should be withdrawn.

Issue 2:

2. Whether Claim 5 is unpatentable over Chun, U.S. Patent 5,644,169 in view of Glenn, U.S. Patent 5,962,810 under 35 U.S.C. § 103 (a).

Claim 5 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Chun in view of Glenn. The applicant respectfully disagrees and submits the Examiner has failed to present a prima facie case of obviousness.

The Examiner stated, "Regarding claim 5, Glenn et al. further teach the adhesive blocking material being a silicon rubber number 3140 from the Dow Corning Company or a Hysol 4451 from Hysol Corporation (Col. 5, lines 12+), which inherently has a tacky characteristic and this adhesive would be obvious to include a gettering function." The Examiner has not provided any evidence that the suggested adhesive "remains tacky to perform a gettering function" as recited by Claim 5 and described at lines 14-16 of page 8 of the specification, nor has the Examiner suggested why a tacky material would be obvious given that much of the package exterior is formed by the bead (see Figures 1, 4, 5, 7, 9, and 12). Furthermore, the Examiner's suggestion appears to contradict the teachings of Glenn, "Bead 20 is formed of a material that is adhesive. The material of bead 20 should also be somewhat viscous and flowable when initially applied onto first surface 12 of substrate 11, but should be readily hardenable by air drying or heating or the like so that bead 20 forms solid, protective side and top surfaces of the package 10. An example material useful for bead 20 is epoxy, such as Ciba Nagase 9006 epoxy from the Ciba Nagase Company of Japan. Hardening of this epoxy is normally accomplished by heating for about 60 minutes at 150° C. Other suitable epoxy materials useable for bead 20 include Hysol 4451 from Hysol Corporation of City of Industry, Calif." (col. 5, lines 6-17).

For the reasons stated above, the Examiner has not met the burden of presenting a prima facie case of obviousness. Therefore, the rejections under 35 U.S.C. § 103(a) is defective and should be withdrawn.

CONCLUSION

For the foregoing reasons, Appellants respectfully submit that the Examiner's final rejection of Claims 1-5 and 7-10 under 35 U.S.C. § 103 (a) as being unpatentable over Chun in view of Glenn is improper, and it is respectfully requested that the Board of Patent Appeals and Interferences so find and reverse the Examiner's rejection.

Please charge any fees necessary in connection with the filing of this paper, including any necessary extension of time fees, to the deposit account of Texas Instruments Incorporated, Deposit Account No. 20-0668.

Respectfully submitted,



Charles A. Brill
Attorney for Applicant
Reg. No. 37,786

Texas Instruments Incorporated
P.O. Box 655474 M/S 399
Dallas, TX 75265
(972) 917-4379
FAX: (972) 917-3511

APPENDIX

1. (amended) A method of protecting debris-intolerant micromechanical devices, said method comprising:
 - attaching a device to a package substrate, said device having at least one debris-generating region, and at least one debris-intolerant region;
 - encapsulating at least one of said debris-generating regions with a blocking material, said blocking material avoiding contact with said debris-intolerant region; and
 - attaching a package lid to said package substrate, to enclose said device and said blocking material.
2. (twice amended) The method of Claim 1, said attaching a device step further comprising:
 - attaching a device to a substrate, said device having at least one said debris-generating region comprising a sidewall.
3. The method of Claim 1, said encapsulating step further comprising:
 - encapsulating at least one of said debris-generating regions using an adhesive blocking material.
4. The method of Claim 1, said encapsulating step further comprising:
 - encapsulating at least one of said debris-generating regions using a photo-curable adhesive blocking material.
5. The method of Claim 1, said encapsulating step further comprising:
 - encapsulating at least one of said debris-generating regions using an adhesive blocking material that remains tacky to perform a gettering function.
6. The method of Claim 1, said encapsulating step comprising the steps of:
 - encapsulating portions of said device with said blocking material; and

removing said blocking material from said debris-intolerant regions.

7. The method of Claim 1, further comprising the step of:

electrically connecting at least one bond pad on said substrate with at least one bond pad on said device using an electrical connection.
8. The method of Claim 7, said encapsulating step comprising:

encapsulating at least one of said debris-generating regions and said electrical connection.
9. The method of Claim 7, said encapsulating step comprising:

electrically connecting at least one bond pad on said substrate with at least one bond pad on said device using a bond wire.
10. The method of Claim 7, said encapsulating step comprising:

encapsulating at least one of said debris-generating regions and said bond wires.